We Claim:

1. A control method in a thermal system containing a component through which a medium flows, the method which comprises:

detecting wall temperatures of the component;

determining a heat flux density of a heat flux from the medium into a wall of the component;

determining a respective heat transmission coefficient from the wall temperatures and the heat flux density; and

determining a heat transmission coefficient and using the heat transmission coefficient to influence properties of the medium, and thereby taking into account heat stresses in the component.

2. The method according to claim 1, which comprises implementing the process steps in a closed-loop control method for regulating the thermal system.

3. The method according to claim 1, which comprises implementing the process steps in an open-loop control method for regulating the thermal system.

4. The method according to claim 1, which comprises implementing the process steps with a component selected from the group consisting of an obstruction-curved component and a thick-walled component through which a medium flows.

5. The method according to claim 1, wherein the step of determining the heat transmission coefficient comprises measuring the wall temperatures of the component at an inside of the wall and substantially in a center of the wall of the component, and determining the heat flux density from the medium into the wall from the wall temperatures.

6. The method according to claim 1, which comprises determining the heat flux density from the medium into the wall of the component by calculating

$$q=\frac{\lambda(T_m-T_i)}{r_i\left[\left(\frac{r_o^2}{r_o^2-r_i^2}\right)^2\ln\frac{r_o}{r_i}-\frac{3r_o^2-r_i^2}{4\left(r_o^2-r_i^2\right)}\right]},$$

where is a temperature difference between the wall temperature substantially at a center of the wall and a wall temperature at an inner part of the wall of the component, λ is the thermal conductivity, r_i is an inner radius and r_o is an outer radius of the wall of the component.

7. The method according to claim 1, which comprises determining the heat transmission coefficient from:

$$\alpha = \frac{q}{T_s - T_i},$$

where T_s is a temperature of the heat flux from the medium into the wall of the component, T_i is a wall temperature at an inner wall surface of the component, and q is the heat flux density.

8. The method according to claim 1, wherein the component is a component part of a power station, and the heat transmission coefficient changing with the varying medium properties is adapted to a profile of a load change in the power station.

9. The method according to claim 8, which comprises including in the properties of the medium a temperature, a mass flow, and a pressure from the medium into the wall of the component.

10. The method according to claim 1, which comprises, taking into account a temperature difference between a measured internal wall temperature and a real temperature on an inner wall of the component, integrating an analytically known temperature profile in the wall of the component into the step of determining the heat transmission coefficient.

11. In combination with a thermal system containing a component conducting a flow of a medium, a process control device, comprising:

a subordinate control loop configured to process a conventional closed-loop control;

an optimizer/desired-value generator connected on an input side of said subordinate control loop, and a feedback for inputting into said optimizer/desired-value generator an output variable fed back from the real process, and process variables transmitted from the thermal system to the process;

said optimizer/desired-value generator determining optimized desired-value profiles for said subordinate control loop from stipulated efficiency criteria, from the output variable, and from the process variables.

12. The device according to claim 11, wherein said optimizer/desired-value generator is configured to derive pilot control for said subordinate control loop from the optimized desired-value profiles.

13. The device according to claim 11, wherein said optimizer/desired-value generator is configured to output actuating values for controlling thermal load changes in the thermal system and is connected to feed the actuating values directly to the process.

14. A process-control device, comprising interconnected control and closed-loop control modules configured to carry out the method according to claim 1.